

**LISTING OF CLAIMS:**

Please amend the claims as follows:

Cancel claims 1-11.

Add the following new claims:

12. (New) A method for balancing traffic across paths connecting a network to the Internet comprising:

forming a connection between a home network and a large network which connects to a plurality of networks, wherein the connection comprises a plurality of paths ( $p$ ), carrying traffic in the form of data packets between the home network and the large network, wherein each path has a path load ( $x_i$ ), which is the amount of traffic allocated to a path ( $p$ ), an available capacity ( $c_i$ ), which is the amount of traffic that the path ( $p$ ) can transmit, and a low capacity boundary ( $l_i$ ) and a high capacity boundary ( $h_i$ ), which are the measured high and low capacity bounds of the available capacity ( $c_i$ );

measuring the path load ( $x_i$ ) of each of the plurality of paths ( $p$ );

measuring the high capacity boundary ( $h_i$ ) of each of the plurality of paths ( $p$ );

comparing the path load ( $x_i$ ) and the high capacity boundary ( $h_i(0)$ ) for each of the plurality of paths ( $p$ );

selecting one of the plurality of paths ( $p$ ), wherein the plurality of paths ( $p$ ) comprises the selected path ( $p_0$ ) and other paths ( $p_i$ ), wherein the selected path ( $p_0$ ) has an initial overload ( $x_0(0)$ ),

and wherein the overload exists when the initial selected path load ( $x_0$ ) is greater than the initial selected path high capacity boundary ( $h_0$ ); and

choosing the path load ( $x_i$ ) for each of the plurality of other paths ( $p_i$ ) using a fractional allocation strategy, wherein the fractional allocation strategy comprises:

(a) indexing the other paths ( $p_i$ ) by  $i$ , wherein  $i$  is a set of integers from 1 to  $P$ , wherein  $P$  is the total number of other paths ( $p_i$ );

(b) associating a plurality of pinning intervals with a counter ( $t$ ), wherein the initial value of the counter is set to zero ( $t = 0$ ) and there are a total of  $N$  pinning intervals;

(c) calculating a portion ( $y(t)$ ) of the initial selected path overload ( $x_0(0)$ ) to be off-loaded and distributed to the other paths ( $p_i$ ) using a bi-sectional search strategy and skipping to step (f);

(d) calculating an updated selected path overload ( $x_0(t)$ ), wherein the updated selected path overload ( $x_0(t)$ ) is equal to the initial selected path overload ( $x_0(0)$ ) less the sum of the low capacity boundary for  $i$  path(s);

(e) calculating the portion ( $y(t)$ ) of the updated selected path load ( $x_0(t)$ ) to be off-loaded and distributed to the other paths ( $p_i$ ) using a bi-sectional search strategy;

(f) measuring the low capacity boundary ( $l_i$ ) and the high capacity boundary ( $h_i$ ) of the other paths ( $p_i$ ) at pinning interval ( $t$ );

(g) distributing the portion ( $y(t)$ ) of the initial selected path overload or the updated selected path load ( $x_0(t)$ ) to the other paths ( $p_i$ ), wherein the portion of the traffic ( $y(t)$ ) is distributed to the other paths ( $p_i$ ) using the equation

$$x_i = l_i(t) + \frac{h_i(t) - l_i(t)}{\sum_{i=1}^P (h_i(t) - l_i(t))} (y(t))$$

and

(h) stopping if there are no more pinning intervals ( $t = N$ ), otherwise increasing the numerical value of the counter by one (1) and go to step (d).

13. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the bi-sectional search strategy chooses the portion ( $y(t)$ ) of the traffic to be off-loaded and distributed using the equation:

$$y(t) = \min \left\{ (0.5) \left[ \sum_{i=1}^P (h_i(t) - l_i(t)) \right], (x_o(t)) \right\}.$$

14. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the amount of traffic from the home network to the large network over the selected path ( $p_o$ ) is measured using flow level measurements or Simple Network Management Protocol (SNMP).

15. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the initial selected path high capacity boundary ( $h_o(0)$ ) is measured using active probes, or passive measurements of traffic details.

16. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the initial selected path high capacity boundary ( $h_o(0)$ ) is

measured using Transmission Control Protocol (TCP) Synchronize/Acknowledgement (SYN/ACK) response time.

17. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the initial selected path high capacity boundary ( $h_0(0)$ ) is measured using Round Trip Time (RTT), and loss measurements.

18. (New) The method for balancing traffic across paths connecting a network to the Internet according to claim 12, wherein the initial selected path low capacity boundary ( $l_0(0)$ ) is equal to 0 and the initial selected path high capacity boundary ( $h_0(0)$ ) is equal to 1.